



New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program
CLASSIFICATION EXCEPTION AREA / WELL RESTRICTION
AREA (CEA/WRA) FACT SHEET FORM

Date Stamp
(For Department use only)

SECTION A. SITE INFORMATION

Site Name: _____

Program Interest (PI) Number(s): _____

Case Tracking Number(s) for this submission: _____

**This form must be attached to the Cover / Certification Form
if not submitted through the Remedial Phase Report Online Service**

1. Indicate the reason for submission of this form (*see instructions*):

- ☐ New CEA ☐ Revise CEA ☐ Reestablish CEA ☐ Existing CEA with no changes
☐ CEA for historic fill ☐ CEA for Historically Applied Pesticides (HAP) ☐ CEA lift/removal

If you are submitting this form for an existing CEA provide the CEA Subject Item ID: _____

2. Indicate the type of ground water Remedial Action (RA):

- ☐ Natural ☐ Active ☐ Final RA not yet selected

3. Is this form being submitted with a Remedial Action Permit (RAP) Form (for Soil or Ground Water)? ☐ Yes ☐ No

SECTION B. CEA COMPONENT AND VAPOR INTRUSION INFORMATION

Name of document that includes the CEA Fate and Transport Description: _____

Date of document: _____

1. **Ground Water Classification:** What is the ground water classification within the CEA as per N.J.A.C. 7:9C?

(Check all that apply)

- ☐ Class I-A ☐ Class II-A
☐ Class I-PL Pinelands Protection Area ☐ Class III-A
☐ Class I-PL Pinelands Preservation Area ☐ Class III-B

2. **Contaminant Data:** This CEA/WRA applies only to the contaminants listed below with concentrations above, or assumed to be above, numeric values established for the applicable classification area via the [Ground Water Quality Standards](#) (GWQS), N.J.A.C. 7:9C. Except for historic fill CEAs based on assumed ground water contamination, list the maximum contaminant value for all ground water data that could be representative of **current** conditions for any well or sampling point used to establish the CEA. See form instructions before entering data into the below table.

| Contaminant | Concentration ⁽¹⁾ | GWQS ⁽²⁾ | SWQS ⁽³⁾ | GWSL ⁽⁴⁾ |
|-------------|------------------------------|---------------------|---------------------|---------------------|
| | | | | |
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Notes: ⁽¹⁾ Maximum concentration in Micrograms Per Liter

⁽²⁾ New Jersey Ground Water Quality Standards, N.J.A.C. 7:9C-1.7 and 1.9(c)

⁽³⁾ [Surface Water Quality Standards](#), N.J.A.C. 7:9B - Applicable only where contaminants in the CEA may discharge to a surface water body.

⁽⁴⁾ Current NJDEP Vapor Intrusion (VI) Ground Water Screening Levels (GWSL) available at <http://www.nj.gov/dep/srp/guidance/vaporintrusion/>

☐ Check if attaching the form Addendum to list additional contaminants and associated information.

Year of tax map used: _____

Is there LNAPL currently found in the CEA? ☐ Yes ☐ No

☐ Check if CEA Boundary has changed (See *instructions*)

☐ Check if Block and Lot numbers have changed (See *instructions*)

[illegible]

* Follow instructions for parcels where the vapor intrusion (VI) pathway was evaluated and the status is indeterminate.

Vertical depth of CEA: _____ (ft bgs) **and** _____ (msl).

Horizontal extent of CEA: _____ Indicate units: ☐ acres or ☐ square feet

Name(s) of the affected Geologic Formation(s)/Unit(s) (see *instructions* if multiple formations/units affected):

Narrative description of proposed CEA boundaries:

Proposed Duration in Years: _____ Anticipated Expiration Date: _____
or ☐ Indeterminate (*Review instructions before selecting “Indeterminate” for the CEA duration.*)

Exhibit A: Site Location Maps – Based on USGS Quadrangle Map;

Exhibit B: CEA Map and Cross Section Figure – See N.J.A.C 7:26C- 7.3(c)1 and 2 and instructions regarding what is required to be included on the map and the cross-section figure.

Exhibit C: GIS Deliverables – CEA Boundary Extent Map. The CEA Boundary Extent Map shall be submitted via email to srpgis_cea@dep.nj.gov. *(See the instructions for detailed GIS deliverable requirements.)*

Identify format of CEA Boundary Extent Map being submitted: ☐ Shape File ☐ CAD File ☐ N/A

If there is a CEA map already on [NJ-GeoWeb](#), does it need to be revised? ☐ Yes ☐ No ☐ N/A

SECTION C. CURRENT GROUND WATER USE DOCUMENTATION

1. Indicate the year of the most recent well search completed per N.J.A.C. 7:26E-1.14: _____
2. If this Fact Sheet form is for a revised CEA or an existing CEA with no changes, have new wells been installed since the CEA was established? ☐ Yes ☐ No ☐ N/A
3. Are there any pumping wells (e.g., potable, industrial, irrigation or recovery wells) within the foot print of the CEA? ☐ Yes ☐ No
If "Yes" list/attach list of the type and status of any pumping well(s) within CEA:

SECTION D. WELL RESTRICTION INFORMATION

Certain well restrictions relevant to potable ground water use, such as "Double Case Wells", "Sample Potable Wells", and "Evaluate Production Wells", are consistently set within the boundaries of all CEAs established by the NJDEP in Class I and II-A areas (*see instructions*).

1. Are there any other site-specific well restrictions relevant to potable ground water use that should be set within or near the boundaries of the proposed CEA? ☐ Yes ☐ No
If "Yes", describe below any such site-specific well restrictions proposed for this CEA:

SECTION E. PUBLIC NOTIFICATION REQUIREMENTS

1. Indicate which of the following entities have been notified pursuant to N.J.A.C. 7:26C-7.3(d) and the dates each notification was sent. (*check all that apply*)
 - ☐ Municipal and county clerk(s) Dated mailed: _____
 - ☐ Local, county or regional health department(s) Dated mailed: _____
 - ☐ Designated County Environmental Health Act agency (if applicable) Dated mailed: _____
 - ☐ County Planning Board Dated mailed: _____
 - ☐ Pinelands Commission (if applicable) Dated mailed: _____
 - ☐ Owners of real property overlying CEA foot print Dated mailed: _____

2. **List of Names and Addresses** – List below and/or in an attachment, the names/addresses of all persons notified pursuant to N.J.A.C. 7:26C-7.3(d) based on the proposed CEA boundaries. If the site property owner differs from the person responsible for conducting the remediation, check here ☐ and enter the site owner's name and address first in the table below. *See instructions for more information regarding the address list.*

[illegible]

ADDENDUM
Classification Exception Area / Well Restriction Area
Fact Sheet Form

Section B. CEA Component and Vapor Intrusion Information

1. **Contaminant Data** (continued): This CEA/WRA applies only to the contaminants listed on page 1 and in the table below with concentrations above, or assumed to be above, numeric values established for the applicable classification area via the GWQS, N.J.A.C. 7:9C. Except for historic fill CEAs based on assumed ground water contamination, list below the maximum contaminant value for all ground water data that could be representative of **current** conditions for any well or sampling point used to establish the CEA. See form Instructions before entering data into the tables below.

| Contaminant | Concentration ⁽¹⁾ | GWQS ⁽²⁾ | SWQS ⁽³⁾ | VI GWSL ⁽⁴⁾ |
|-------------|------------------------------|---------------------|---------------------|------------------------|
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Notes: ⁽¹⁾ Maximum concentration in Micrograms Per Liter
⁽²⁾ New Jersey Ground Water Quality Standards, N.J.A.C. 7:9C-1.7 and 1.9(c)
⁽³⁾ Surface Water Quality Standards, N.J.A.C. 7:9B - Applicable only where contaminants in the CEA may discharge to a surface water body.
⁽⁴⁾ Current NJDEP Vapor Intrusion (VI) Ground Water Screening Levels (GWSL)

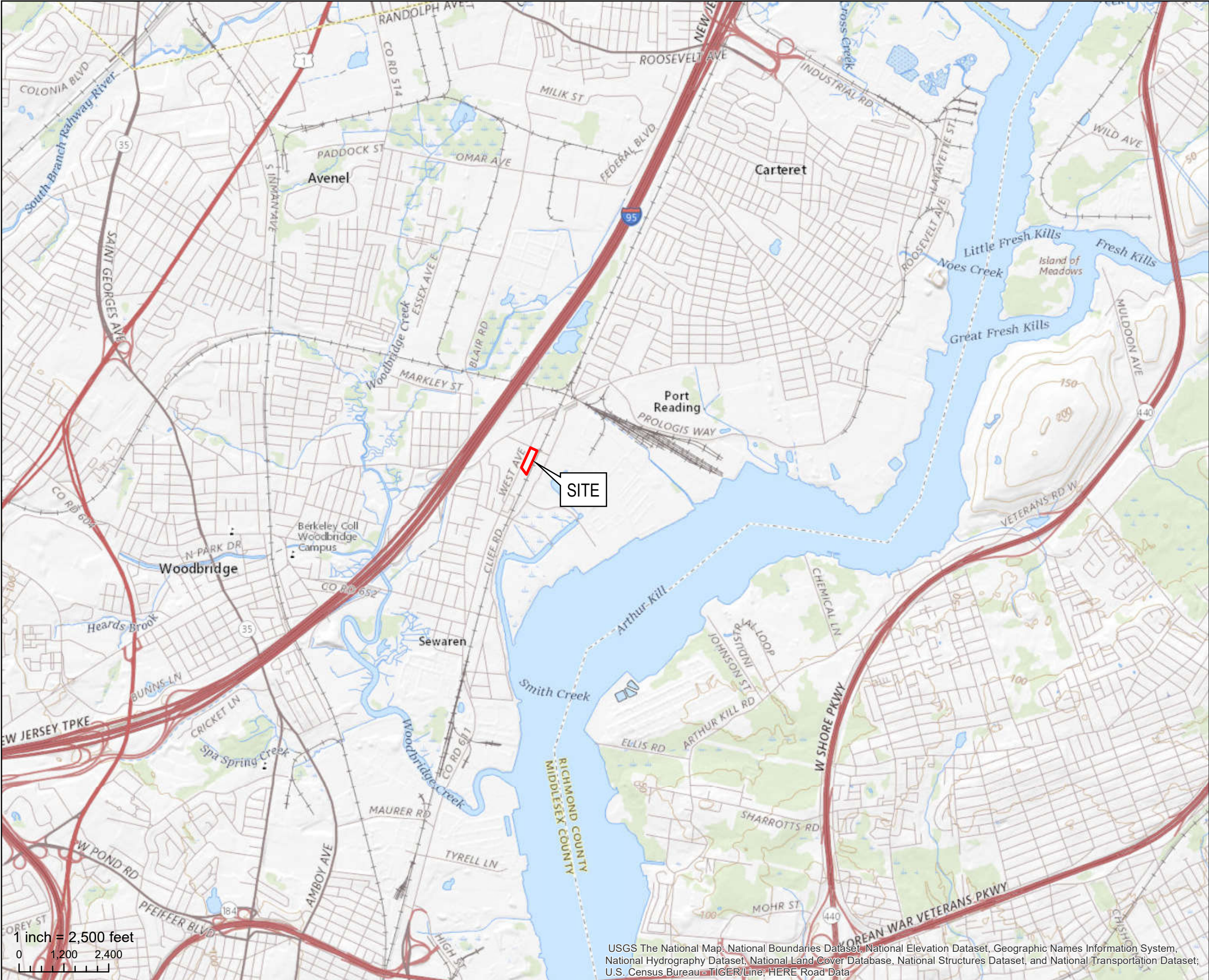
2. **CEA Boundaries and VI Pathway Status** (continued): List additional parcels included in the CEA. Attach additional Addendum sheets if necessary to list all blocks and lots within the CEA.

For CEA revisions, check here if block and lot numbers have changed: ☐

| Block | Lot(s) | Check if off-site | Check if VI pathway was evaluated * | Check if VI pathway status is indeterminate * |
|-------|--------|--------------------------|-------------------------------------|---|
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
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| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

* Follow instructions for parcels where the vapor intrusion (VI) pathway was evaluated and status is indeterminate.

Document Path: P:\ArcGIS\Hess Projects\1114\00 - Port Reading Hess\1114\001 - Stewide\GIS\Port Reading - USGS Site Location Figure.mxd



LEGEND

QC Laboratory Site Boundary

NEW JERSEY QUADRANGLE LOCATION:
JERSEY CITY, NEW JERSEY

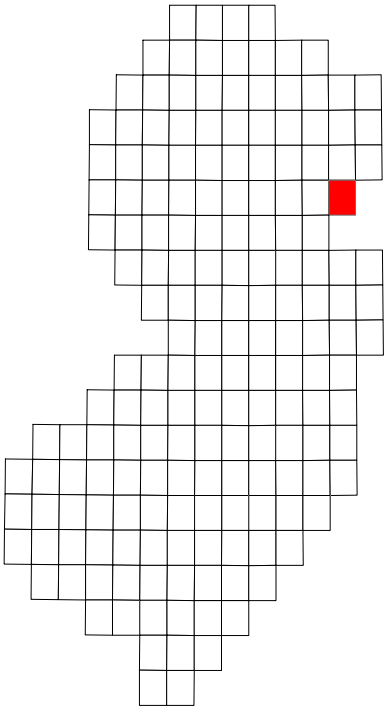


Exhibit A-1:
USGS Site Location Map
QC Laboratory

HESS CORPORATION
FORMER PORT READING TERMINAL
835 WEST AVENUE
PORT READING, NEW JERSEY

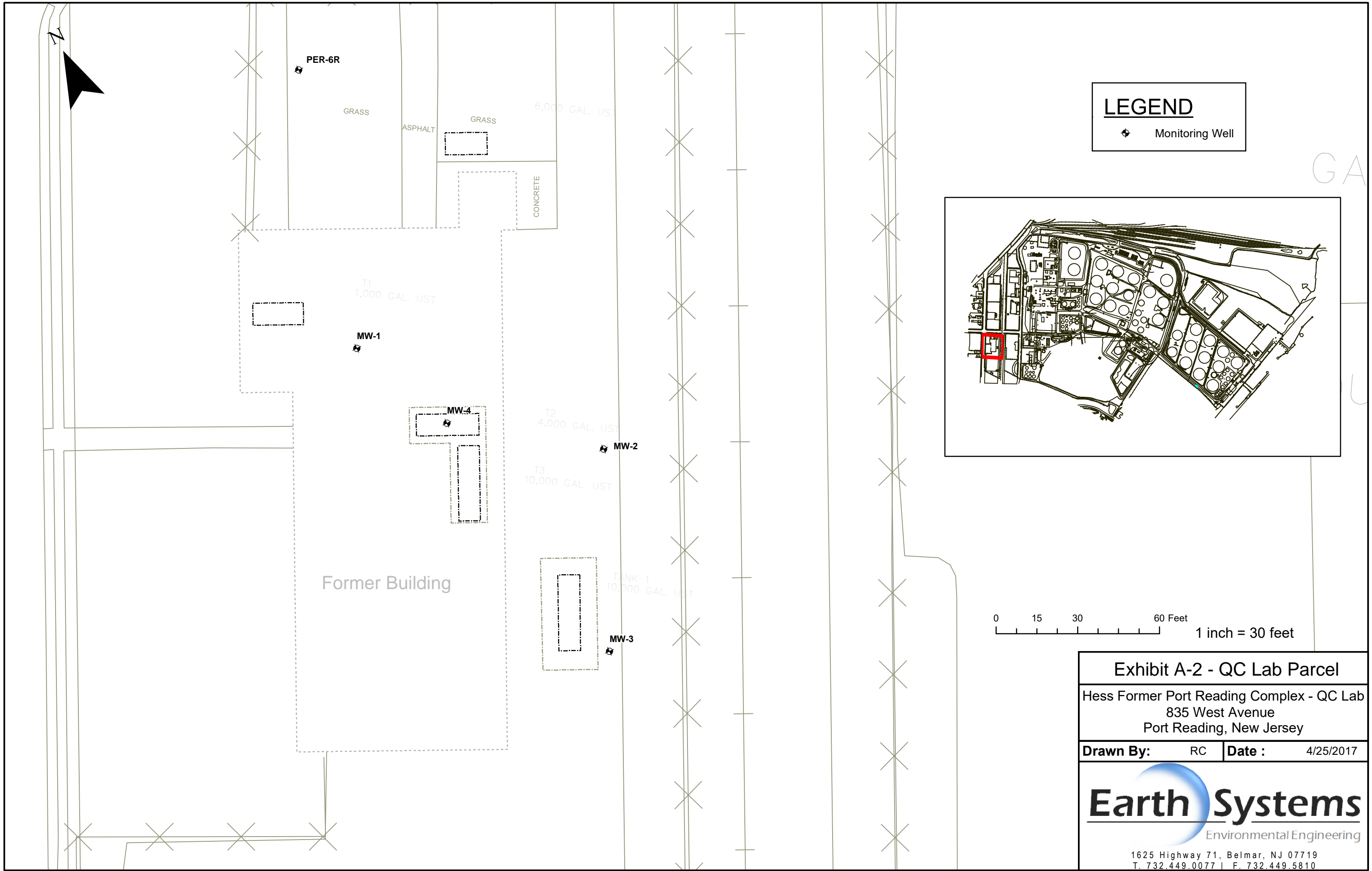
| | | | |
|------------|---------|-----------|-----------|
| Project #: | 1114J01 | Drawn: | 4/16/2020 |
| SRP PI#: | 006148 | Drawn By: | KJ |



Environmental Engineering
1625 Highway 71, Belmar, NJ 07719
T. 732.739.6444 | F. 732.739.0451

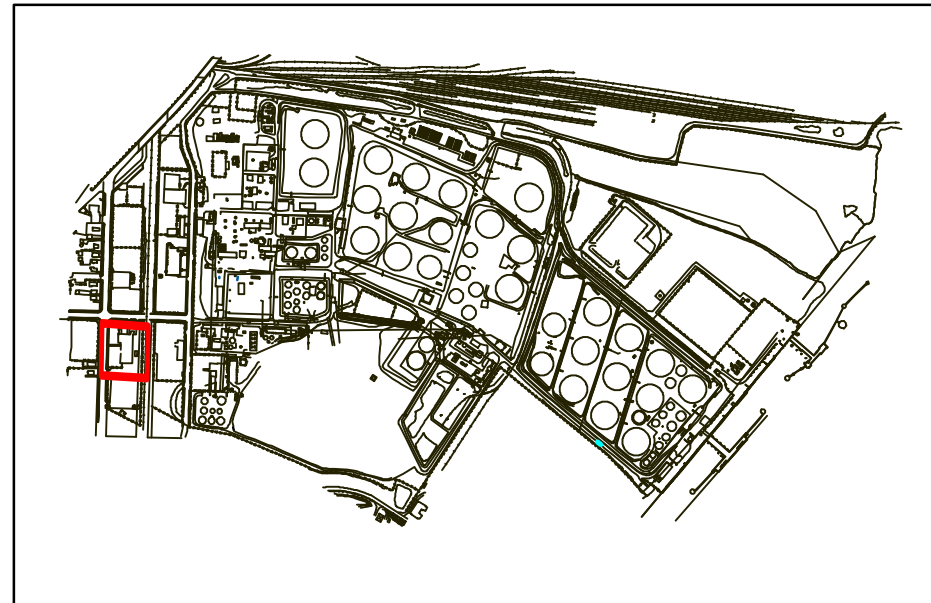
This map was developed using New Jersey Department of Environmental Protection Geographic Information System Digital Data, but this secondary product has not been verified by NJDEP and is not state Authorized. Source: NAD 1983 (2011) New Jersey State Plane FIPS 2900 US FT.

USGS The National Map, National Boundaries Dataset, National Elevation Dataset, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau TIGER/Line; HERE Road Data



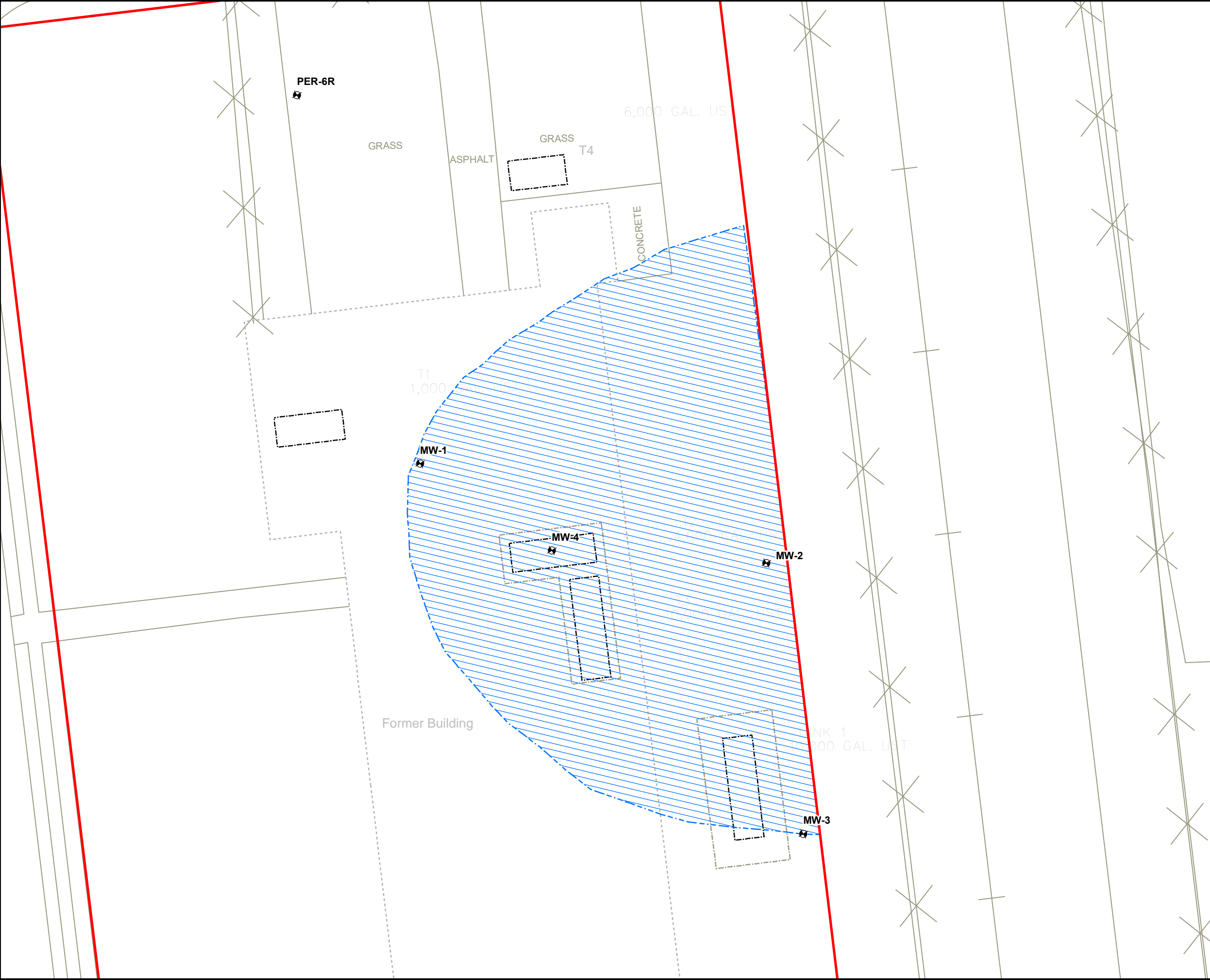
LEGEND

Monitoring Well



0 15 30 60 Feet
1 inch = 30 feet

| | |
|--|------------------|
| Exhibit A-2 - QC Lab Parcel | |
| Hess Former Port Reading Complex - QC Lab 835 West Avenue Port Reading, New Jersey | |
| Drawn By: RC | Date : 4/25/2017 |
| | |
| 1625 Highway 71, Belmar, NJ 07719 T. 732.449.0077 F. 732.449.5810 | |



LEGEND

- Site Parcel Boundary
- Monitoring Well
- CEA (Estimated)



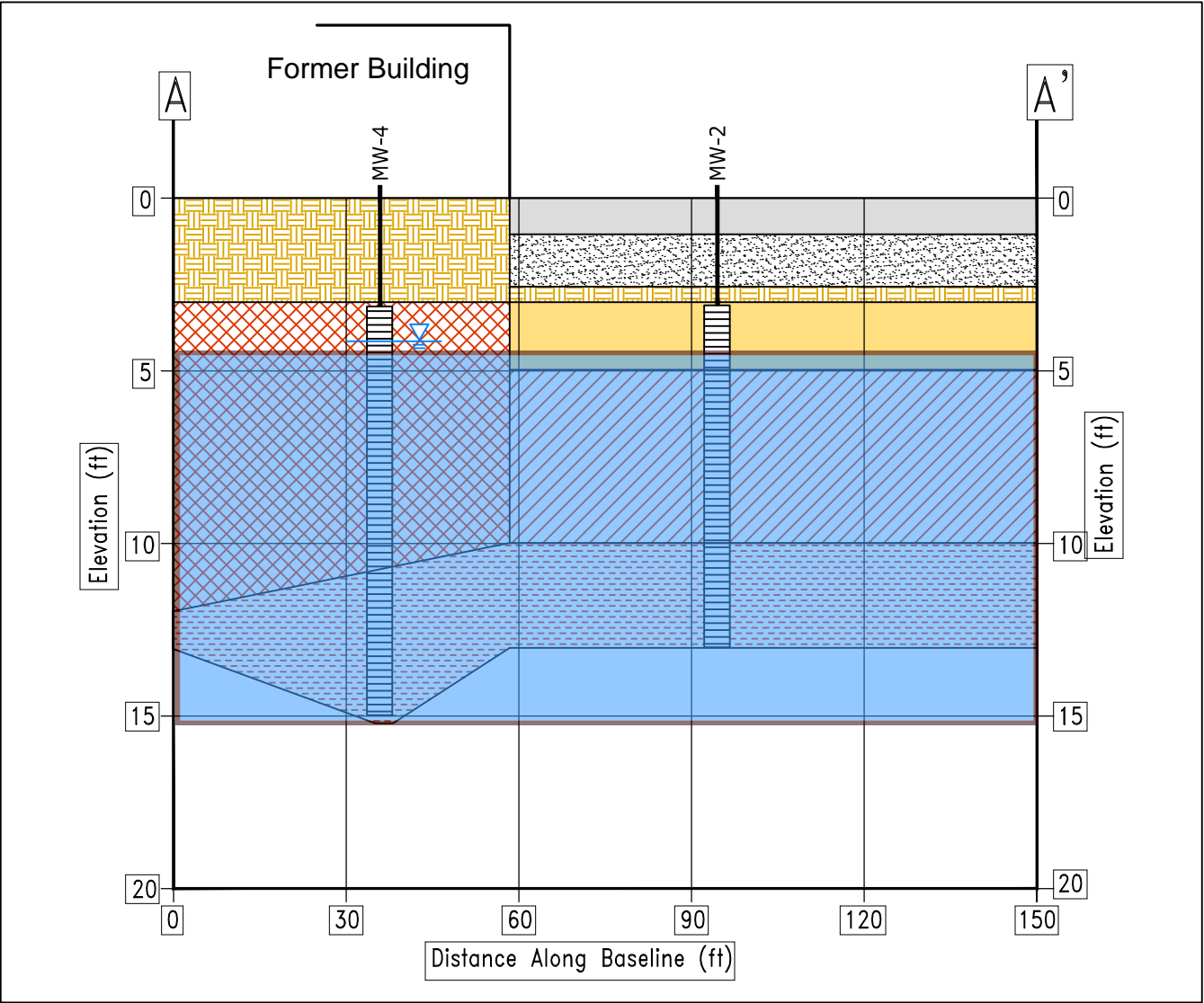
Exhibit B -1 - CEA Boundary Map

Hess Former Port Reading Complex - QC Lab
835 West Avenue
Port Reading, New Jersey

Drawn By: RC Date : 06/02/2017



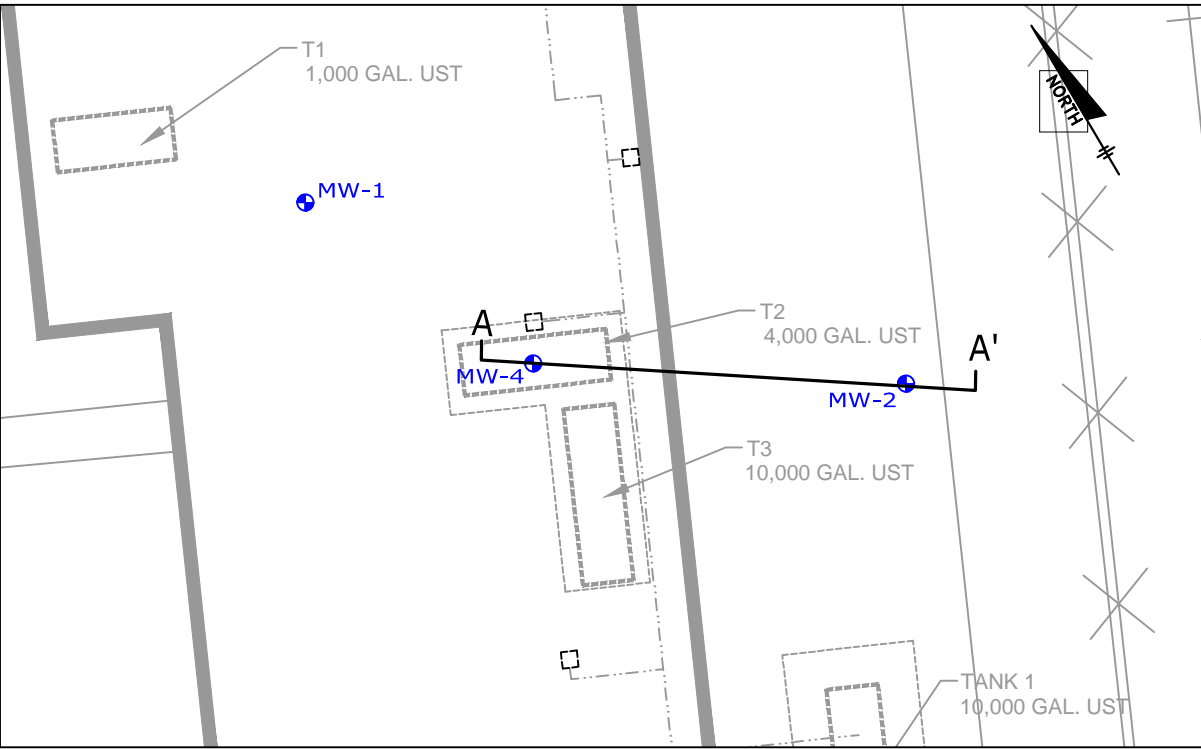
1625 Highway 71, Belmar, NJ 07719
T. 732.449.0077 | F. 732.449.5810



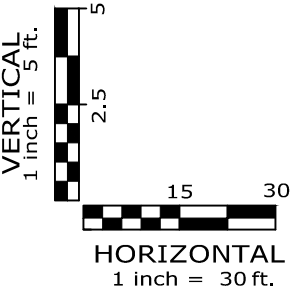
LEGEND

- ASPHALT
- GRAVEL
- OVERBURDEN
- BROWN SANDY SILT-SATURATED
- RED BROWN SANDY CLAY
- RED BROWN CLAY
- SAND/FILL/MIXED MATERIALS

- MW-4
MONITORING WELL AND SCREEN LOCATION AND ID
- APPROXIMATE SHALLOW GROUND WATER ELEVATION
- CEA



KEYMAP
SCALE: 1"=30'



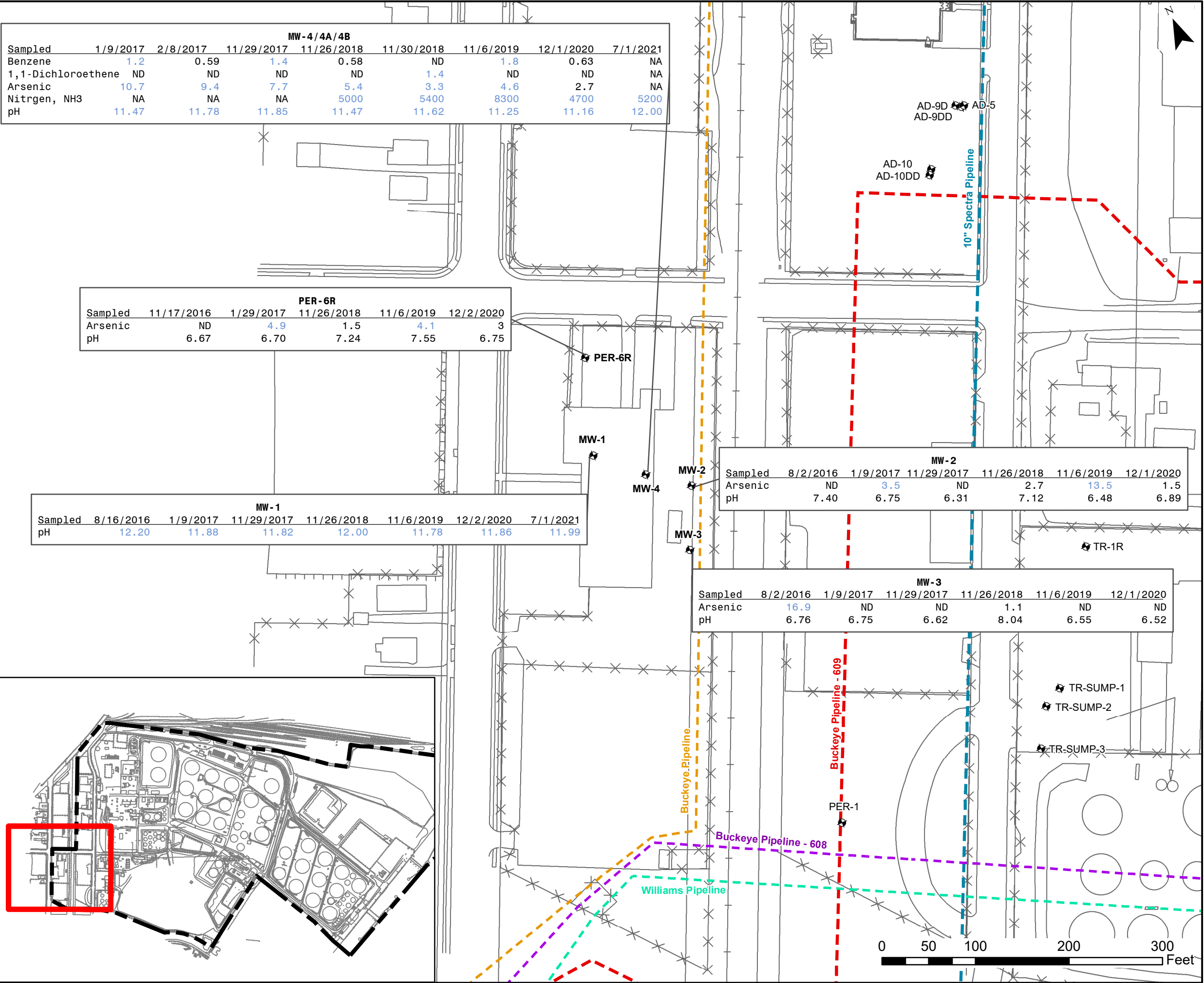
GEOLOGIC CROSS SECTION

HESS CORPORATION
HESS PORT READING COMPLEX
FORMER QC LABORATORY
835 WEST AVENUE
PORT READING, NEW JERSEY



Exhibit B-2

Document Path: A:\HESS Projects\1114J00 - Port Reading Hess\1114J01 - Sitewide\GIS\QC LAB\Port Reading - 2016 - 2021 Groundwater Results QC Lab.mxd



LEGEND

Monitoring Well

| NJ Groundwater Criteria | |
|-------------------------|---------|
| Benzene | 1 |
| 1,1-Dichloroethene | 1 |
| Arsenic | 3 |
| Nitrogen, Ammonia | 3000 |
| pH | 6.5-8.5 |

NOTE:
1. Results were measured in ug/l
2. Pipelines:
- Solid Line: Aboveground
- Dotted Line: Underground
3. ND - Non Detect; method detection limit below
NJDEP Groundwater Criteria
4. BLUE; Exceedance > Criteria

Exhibit C
2016 - 2021 Groundwater
Sampling Results

HESS CORPORATION
FORMER PORT READING COMPLEX
750 CLIFF ROAD
PORT READING, NEW JERSEY

| | | | |
|------------|---------|-----------|------------|
| Project #: | 1114J01 | Drawn: | 08/04/2021 |
| SRP PI#: | 006148 | Drawn By: | AE |

Earth Systems
Environmental Engineering
1625 Highway 71, Belmar, NJ 07719
T. 732.739.6444 | F. 732.739.0451

This map was developed using New Jersey Department of Environmental Protection Geographic Information System Digital Data, but this secondary product has not been verified by NJDEP and is not state Authorized. Source: NAD 1983 (2011) New Jersey State Plane FIPS 2900 US FT.

**Former Hess Coporation Port Reading Terminal
QC Laboratory Parcel
835 West Avenue
Port Reading, NJ**

| Well ID | Lab ID | Sample Date | Acetone | Benzene | Bromochloromethane | Bromodichloromethane | Bromoform | Bromomethane | 2-Butanone (MEK) | Carbon disulfide | Carbon tetrachloride | Chlorobenzene | Chloroethane | Chloroform | Chloromethane | Cyclohexane | 1,2-Dibromo-3-chloropropane | Dibromochloromethane | 1,2-Dibromomethane | 1,2-Dichlorobenzene | 1,3-Dichlorobenzene | 1,4-Dichlorobenzene | Dichlorodifluoromethane | 1,1-Dichloroethane | 1,2-Dichloroethane | 1,1-Dichloroethene | cis-1,2-Dichloroethene | trans-1,2-Dichloroethene |
|---------|------------|-------------|---------|---------|--------------------|----------------------|-----------|--------------|------------------|------------------|----------------------|---------------|--------------|------------|---------------|-------------|-----------------------------|----------------------|--------------------|---------------------|---------------------|---------------------|-------------------------|--------------------|--------------------|--------------------|------------------------|--------------------------|
| GWQS | | | 6000 | 1 | - | 1 | 4 | 10 | 300 | 700 | 1 | 50 | 5 | 70 | NS | NS | 0.02 | 1 | 0.03 | 600 | 600 | 75 | 1000 | 50 | 2 | 1 | 70 | 100 |
| MW-1 | JC25088-1 | 8/2/2016 | ND | 0.25 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-1 | JC35066-1 | 1/9/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-1 | JC56220-2 | 11/29/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-1 | JC78529-12 | 11/26/2018 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-1 | JC98148-13 | 11/6/2019 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-1 | JD17077-1 | 12/2/2020 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JC25088-2 | 8/2/2016 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JC35066-1 | 1/9/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JC56220-3 | 11/29/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JC78529-13 | 11/26/2018 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JC98148-14 | 11/6/2019 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-2 | JD17100-10 | 12/1/2020 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JC25088-3 | 8/2/2016 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JC35066-3 | 1/9/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JC56220-4 | 11/29/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JC78529-14 | 11/26/2018 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JC98148-15 | 11/6/2019 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-3 | JD17100-9 | 12/1/2020 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC35066-4 | 1/9/2017 | 105 | 1.2 | ND | ND | ND | ND | 4.7 J | 0.48 J | ND | ND | ND | ND | ND | 2.7 J | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC35066-4 | 2/8/2017 | 54.3 | 0.59 | ND | ND | ND | ND | 4.3 J | 0.40 J | ND | ND | ND | ND | ND | 0.76 J | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC56220-5 | 11/29/2017 | 25 | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.67 J | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC78529-15 | 11/26/2018 | 15.3 | 0.58 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC78811-5 | 11/30/2018 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JC98148-16 | 11/6/2019 | 15.1 | 1.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| MW-4 | JD17100-11 | 12/1/2020 | 8.4 J | 0.63 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JC31999-7 | 11/17/2016 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | NA | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JC56220-1 | 1/29/2017 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JC78529-16 | 11/26/2018 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JC98148-17 | 11/6/2019 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JD17077-2 | 12/2/2020 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

[illegible]

NA - Not Analyzed, ND - Non-Detect, J - Estimated Concentration

**Former Hess Coporation Port Reading Terminal
QC Laboratory Parcel
835 West Avenue
Port Reading, NJ**

[illegible][illegible]

NA - Not Analyzed, ND - Non-Detect, J - Estimated Concentration

| Former Hess Coporation Port Reading Terminal QC Laboratory Parcel 835 West Avenue | | | | | | | | | | | | | | | | | | | | | | | | |
|---|------------|-------------|-----------|----------|---------|--------|-----------|---------|---------|----------|--------|--------|-------|------|-----------|------------|---------|--------|----------|--------|---------|----------|------|-------------------|
| Well ID | Lab ID | Sample Date | Aluminum* | Antimony | Arsenic | Barium | Beryllium | Cadmium | Calcium | Chromium | Cobalt | Copper | Iron* | Lead | Magnesium | Manganese* | Mercury | Nickel | Selenium | Silver | Sodium* | Thallium | Zinc | Nitrogen, Ammonia |
| GWQS | | | 200 | 6 | 3 | 6000 | 1 | 4 | - | 70 | 100 | 1300 | 300 | 5 | - | 50 | 2 | 100 | 40 | 40 | 50000 | 2 | 2000 | 3** |
| MW-1 | JC25088-1 | 8/2/2016 | 4240 | ND | ND | ND | ND | ND | 109000 | 21.1 | ND | 30.9 | ND | ND | ND | ND | ND | ND | ND | ND | 94800 | ND | ND | NA |
| MW-1 | JC35066-1 | 1/9/2017 | 1760 | ND | ND | ND | ND | ND | 98100 | 10.7 | ND | ND | 150 | ND | ND | ND | ND | ND | ND | ND | 49000 | ND | ND | NA |
| MW-1 | JC56220-2 | 11/29/2017 | ND | ND | ND | ND | ND | ND | 26600 | ND | ND | ND | 1450 | ND | 9710 | 2840 | ND | ND | ND | ND | 206000 | ND | ND | NA |
| MW-1 | JC78529-12 | 11/26/2018 | 1830 | ND | 1.3 | ND | ND | ND | 102000 | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 20200 | ND | ND | ND |
| MW-1 | JC98148-13 | 11/6/2019 | 2090 | ND | 2.2 | ND | ND | ND | 96400 | 17.1 | ND | 34.1 | 592 | ND | ND | ND | ND | ND | ND | ND | 22300 | ND | ND | ND |
| MW-1 | JD17077-1 | 12/2/2020 | 1250 | ND | 1.4 | ND | ND | ND | 75600 | ND | ND | 16.5 | ND | ND | ND | ND | ND | ND | ND | ND | 14700 | ND | ND | ND |
| MW-2 | JC25088-2 | 8/2/2016 | ND | ND | ND | 588 | ND | ND | 63900 | ND | ND | ND | 3770 | ND | 28200 | 8580 | ND | 26.2 | ND | ND | 273000 | ND | ND | NA |
| MW-2 | JC35066-1 | 1/9/2017 | 521 | ND | 3.5 | 261 | ND | ND | 30100 | ND | ND | ND | 764 | ND | 12600 | 3850 | ND | 14.6 | ND | ND | 197000 | ND | ND | NA |
| MW-2 | JC56220-3 | 11/29/2017 | ND | ND | ND | ND | ND | ND | 26600 | ND | ND | ND | 1450 | ND | 9710 | 2840 | ND | ND | ND | ND | 206000 | ND | ND | NA |
| MW-2 | JC78529-13 | 11/26/2018 | 261 | ND | 2.7 | ND | ND | ND | 28000 | ND | ND | ND | 838 | ND | ND | 419 | ND | ND | ND | ND | 74800 | ND | ND | 390 |
| MW-2 | JC98148-14 | 11/6/2019 | 256 | ND | 13.5 | ND | ND | ND | 20400 | ND | ND | 22.9 | 6520 | ND | ND | 343 | ND | ND | ND | ND | 88400 | ND | 36.8 | ND |
| MW-2 | JD17100-10 | 12/1/2020 | ND | ND | 1.5 | ND | ND | ND | 25300 | ND | ND | ND | 492 | ND | ND | 84 | ND | ND | ND | ND | 27700 | ND | ND | 210 |
| MW-3 | JC25088-3 | 8/2/2016 | 1770 | ND | 16.9 | ND | ND | ND | 12000 | ND | ND | ND | 15100 | ND | ND | 1980 | ND | ND | ND | ND | 53400 | ND | ND | NA |
| MW-3 | JC35066-3 | 1/9/2017 | 2230 | ND | ND | ND | ND | ND | 11000 | ND | ND | ND | 6180 | ND | ND | 1860 | ND | ND | ND | ND | 46600 | ND | 20.7 | NA |
| MW-3 | JC56220-4 | 11/29/2017 | 920 | ND | ND | ND | ND | ND | 10500 | ND | ND | ND | 2590 | ND | ND | 1390 | ND | ND | ND | ND | 37500 | ND | ND | NA |
| MW-3 | JC78529-14 | 11/26/2018 | 436 | ND | 1.1 | ND | ND | ND | 17900 | ND | ND | 13 | 809 | ND | ND | 65.8 | ND | ND | ND | ND | 14000 | ND | ND | ND |
| MW-3 | JC98148-15 | 11/6/2019 | ND | ND | ND | ND | ND | ND | 17800 | ND | ND | ND | 324 | ND | ND | 834 | ND | ND | ND | ND | 25000 | ND | 53.9 | 410 |
| MW-3 | JD17100-9 | 12/1/2020 | ND | ND | ND | ND | ND | ND | 16200 | ND | ND | 16.3 | 323 | ND | ND | 134 | ND | ND | ND | ND | ND | ND | 25.7 | ND |
| MW-4 | JC35066-4 | 1/9/2017 | 2080 | ND | 10.7 | ND | ND | ND | 107000 | ND | ND | 21.7 | 547 | ND | ND | ND | ND | ND | ND | ND | 60000 | ND | ND | NA |
| MW-4 | JC35066-4 | 2/8/2017 | 2620 | ND | 9.4 | ND | ND | ND | 83400 | ND | ND | ND | 1410 | ND | ND | 19.2 | ND | ND | ND | ND | 43000 | ND | ND | NA |
| MW-4 | JC56220-5 | 11/29/2017 | 3950 | ND | 7.7 | ND | ND | ND | 110000 | ND | ND | ND | 436 | ND | ND | ND | 0.27 | ND | ND | ND | 63500 | ND | ND | NA |
| MW-4 | JC78529-15 | 11/26/2018 | 9030 | ND | 5.4 | ND | ND | ND | 62700 | ND | ND | ND | 9400 | ND | ND | 85.5 | 0.42 | ND | ND | ND | ND | ND | ND | 5 |
| MW-4 | JC78811-5 | 11/30/2018 | 2870 | ND | 3.3 | ND | ND | ND | 64300 | ND | ND | ND | 736 | ND | ND | ND | ND | ND | ND | ND | 39800 | ND | ND | 5.4 |
| MW-4 | JC98148-16 | 11/6/2019 | 3840 | ND | 4.6 | ND | ND | ND | 99300 | ND | ND | 20.7 | ND | ND | ND | ND | 0.27 | ND | ND | ND | 58600 | ND | ND | 8.3 |
| MW-4 | JD17100-11 | 12/1/2020 | 2240 | ND | 2.7 | ND | ND | ND | 48300 | ND | ND | ND | 239 | ND | ND | ND | ND | ND | ND | ND | 32200 | ND | ND | 4.7 |
| PER-6R | JC31999-7 | 11/17/2016 | 494 | ND | ND | ND | ND | ND | 76900 | ND | ND | 15.3 | 438 | ND | 8590 | ND | ND | ND | ND | ND | 63300 | ND | ND | NA |
| PER-6R | JC56220-1 | 1/29/2017 | 1420 | ND | 4.9 | ND | ND | ND | 43800 | ND | ND | 20 | 5080 | 3.8 | 6410 | ND | ND | ND | ND | ND | 26600 | ND | ND | NA |
| PER-6R | JC78529-16 | 11/26/2018 | 411 | ND | 1.5 | ND | ND | ND | 31000 | ND | ND | 12.4 | 886 | ND | ND | 16.1 | ND | ND | ND | ND | ND | ND | ND | ND |
| PER-6R | JC98148-17 | 11/6/2019 | 2860 | ND | 4.1 | ND | ND | ND | 55300 | ND | ND | 23.9 | 4710 | ND | 7380 | ND | ND | ND | ND | ND | 12600 | ND | 27.5 | <200 |
| PER-6R | JD17077-2 | 12/2/2020 | 1350 | ND | 3 | ND | ND | ND | 43200 | ND | ND | 26.1 | 3520 | ND | 6690 | ND | ND | ND | ND | ND | ND | ND | 37.3 | ND |

*Not considered a Contaminant of Concern for the AOC (so exceedances are not highlighted), NA - Not Analyzed, ND - Non-Detect, J - Estimated Concentration

** Unit in
mg/L

CLASSIFICATION EXCEPTION AREA (CEA)

EXHIBIT D

1 Background Information

This Classification Exception Area (CEA) is being established for the area of concern (AOC) designated as AOC-19: Former Quality Control Laboratory (QC Lab or Site) associated with the Hess Corporation Former Port Reading Complex (HC-PR). The former QC Lab is located on Block 664.01 and Lot 1.01 (835 West Avenue, Port Reading, Middlesex County, New Jersey). The building on-site was demolished in 2015, and the recycled building concrete was reused (via a Beneficial Use Determination) as backfill. Recycled concrete has been known to produce leachate that has high alkalinity and consequently could be the source of the elevated pH readings in groundwater samples collected from MW-1 and MW-4.

As part of the investigation of AOC-19, a groundwater sample was collected from a temporary well point (TW-T2-5) in 2016 and several volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) were detected above the Ground Water Quality Standard (GWQS). To address the groundwater impacts present in the former UST T2 location, 478 tons of soil were excavated for off-site disposal. Monitoring wells MW-1, MW-2, MW-3, and PER-6R were installed prior to soil remediation and monitoring well MW-4 was installed in the former temporary well location (TW-T2-5) to determine if soil remediation activities were effective. Soil remediation activities were completed June 2016.

Groundwater samples were collected via low-flow sampling methodology in accordance with the NJDEP's *Field Sampling Procedures Manual* (FSPM), except for the November 26, 2018 samples which were collected via volume average purging methodology in accordance with the NJDEP's FSPM.

Post remediation groundwater samples have been collected in January 2017, February 2017 (MW-4 only), November 2017, November 2018, November 2019, December 2020, and July 2021 (MW-1 and MW-4 only) and sporadic exceedances of benzene have been detected in the groundwater samples, indicating only residual impacts remain. Arsenic, which is unrelated to the former underground storage tanks (USTs), has been detected over the GWQS in several rounds of groundwater sampling. During the most recent round of groundwater sampling, ammonia was detected slightly over the GWQS. pH has been detected between 11 and 12 in MW-1 and MW-4. The following table summarizes the groundwater concentrations that have exceeded the GWQS for the last four (4) rounds of sampling.

| Well ID | Sample Date | Compound | Concentration | GWQS |
|---------|---------------|----------|---------------|---------|
| MW-4 | January 2017 | Benzene | 1.2 ppb | 1 ppb |
| MW-2 | January 2017 | Arsenic | 3.5 ppb | 3 ppb |
| MW-4 | January 2017 | Arsenic | 10.7 ppb | 3 ppb |
| MW-1 | January 2017 | pH | 11.88 | 6.5-8.5 |
| MW-4 | January 2017 | pH | 11.98 | 6.5-8.5 |
| MW-4 | February 2017 | Arsenic | 9.4 ppb | 3 ppb |
| MW-4 | February 2017 | pH | 11.85 | 6.5-8.5 |
| MW-1 | November 2017 | Arsenic | 3.5 ppb | 3 ppb |
| MW-4 | November 2017 | Arsenic | 7.7 ppb | 3 ppb |
| PER-6R | November 2017 | Arsenic | 4.9 ppb | 3 ppb |
| MW-4 | November 2017 | Benzene | 1.4 ppb | 1 ppb |
| MW-1 | November 2017 | pH | 11.82 | 6.5-8.5 |
| MW-4 | November 2017 | pH | 11.78 | 6.5-8.5 |

| Well ID | Sample Date | Compound | Concentration | GWQS |
|---------|---------------|----------|---------------|-----------|
| MW-4 | November 2018 | Arsenic | 5.4 ppb | 3 ppb |
| MW-4 | November 2018 | Ammonia | 5,400 ppb | 3,000 ppb |
| MW-1 | November 2018 | pH | 12.00 | 6.5-8.5 |
| MW-4 | November 2018 | pH | 11.62 | 6.5-8.5 |

| Well ID | Sample Date | Compound | Concentration | GWQS |
|---------|---------------|----------|---------------|-----------|
| MW-2 | November 2019 | Arsenic | 13.5 ppb | 3 ppb |
| MW-4 | November 2019 | Arsenic | 4.6 ppb | 3 ppb |
| PER-6 | November 2019 | Arsenic | 4.1 ppb | 3 ppb |
| MW-4 | November 2019 | Benzene | 1.8 ppb | 1 ppb |
| MW-4 | November 2019 | Ammonia | 8,300 ppb | 3,000 ppb |
| MW-1 | November 2010 | pH | 11.78 | 6.5-8.5 |
| MW-4 | November 2019 | pH | 11.25 | 6.5-8.5 |

| Well ID | Sample Date | Compound | Concentration | GWQS |
|---------|---------------|----------|---------------|-----------|
| MW-4 | December 2020 | Ammonia | 4,700 ppb | 3,000 ppb |
| MW-1 | December 2020 | pH | 11.86 | 6.5-8.5 |
| MW-4 | December 2020 | pH | 11.16 | 6.5-8.5 |
| MW-4 | July 2021 | Ammonia | 5,200 ppb | 3,000 ppb |
| MW-1 | July 2021 | pH | 11.20 | 6.5-8.5 |
| MW-4 | July 2021 | pH | 11.40 | 6.5-8.5 |

ppb = parts per billion

This CEA is being established to address low-level concentrations of benzene, arsenic, ammonia, and pH. Aluminum, iron, manganese, and sodium are also included in the CEA, as requested by the NJDEP case team. However, these compounds are not site-related and are commonly detected in groundwater in urban areas due to high impervious surface cover and reducing conditions. Once the CEA is established and the Remedial Action Permit (RAP) is approved, the Licensed Site Remediation Professional (LSRP) will issue a Limited Restricted Use Response Action Outcome (RAO) to close out the AOC. Results from 2016 through 2021 have been presented in Exhibit C.

2 Description of Fate and Transport – CEA Longevity

The contaminants of concern (COCs) associated with the site are benzene, arsenic, ammonia, and pH. An analog calculation was completed to evaluate the fate and transport of benzene, arsenic, ammonia, and pH at the Site. It is believed that the assumptions and limitations specified for the analog model are satisfied at the Site. The model indicates that the output will be a conservative estimate.

Laboratory data results from MW-4 for benzene (1.8 ppb), arsenic (10.7 ppb), and ammonia (8,300 ppb) were used for the contaminant fate and transport modeling at the Site. The results are presented as an Attachment to this document.

- An estimated plume length for benzene of approximately 32.70 feet east-southeast of monitoring well MW-4 with a duration of approximately 0.23 years;
- An estimated plume length for arsenic of approximately 38.51 feet to the east-southeast of MW-4 with a duration of approximately 11.92 years;
- An estimated plume length for ammonia of approximately 1283.33 feet to the east-southeast of MW-4 with a duration of approximately 8.81 years;

Based on these conservative calculations, the proposed duration of the CEA is twelve (12) years.

As per current NJDEP requirements for monitoring the protectiveness of an institutional control (i.e. the CEA), a Biennial Certification will be submitted every two (2) years, subsequent to the approval of the CEA. The Biennial Certification will be prepared in accordance with NJDEP guidance and/or forms in effect at the time of the submittal of the Biennial Certification.

3 Horizontal and Vertical Extent of CEA

The horizontal extent of the CEA is approximately 12,000 square feet. Groundwater direction generally flows in the east, southeast direction. MW-4 has been delineated by MW-1, MW-2, MW-3, and PER-6. The delineation wells have shown natural background conditions or are less than the GWQS, as noted in Exhibit C. The vertical depth of the CEA has been assumed to be confined to the shallow groundwater table, approximately 15 feet below grade. The vertical depth has been assumed based on a review of the monitoring well logs which show a tight formation of red clay which functions as a confining layer located at approximately 12 feet below grade.

4 Monitored Natural Attenuation (MNA)

Monitored natural attenuation (MNA) is the remedial action selected to address benzene, arsenic, and ammonia impacts at the Site. MNA refers to the reliance on natural attenuation processes to achieve the applicable ground water remediation standard. Natural attenuation processes include a variety of physical, chemical, or biological processes that, under favorable conditions, act without human intervention to reduce the mass, toxicity, mobility, volume, or concentration of contaminants in ground water. These processes include biodegradation, dispersion, dilution, sorption, volatilization, and chemical or biological stabilization, transformation, or destruction of contaminants.

MNA is the appropriate remedy to address the groundwater impacts associated with this Site for the following reasons:

- Soil remediation was completed at the Site which effectively removed all source impacted soils.

5 Monitoring Schedule

Groundwater at the Site is impacted with low levels of benzene, arsenic, pH, and ammonia. Groundwater sampling of the QC lab wells will be conducted on an annual basis for benzene, arsenic, pH, and ammonia analysis.

CEA Calculations

MW-4 Arsenic

Chemical K_{OC} = 12,500 cm³/g
<http://www.seview.com/newsletter/mobility.html>

$$R = 1 + (K_{OC} \cdot f_{OC} \cdot B) / n_e$$

54.5714

$$V_p = (K \cdot I) / (n_e \cdot R)$$

0.0088482 feet/day **3.23 feet/year**

Soil Characteristic Values

| | |
|------------|-----------------------|
| f_{OC} = | 0.001 |
| B = | 1.5 g/cm ³ |
| n_e = | 0.35 |
| K = | 13 feet/day |
| i = | 0.013 feet/foot |

Duration of CEA

$$C = C_o e^{-kt}$$

C = Final Concentration = 3 µg/L (NJDEP Groundwater Quality Standard)
C_o = Initial Concentration = 10.7 µg/L (most recent sampling event)
t/2 = half-life (days) = 2372 days <https://pdfs.semanticscholar.org/1919/d6d9db111338328fbd5eb353336ae865eb.pdf>
t = time
k = $\frac{0.693}{t/2}$ = 0.0002922

$$t = \frac{(-\ln C / C_o)}{k}$$

4352.54 days
11.92 years

CEA Distance

$$d = V_p \cdot t \text{ (distance = transport rate} \cdot \text{time)}$$

= **38.51 ft.**

Notes:

- [K] = Hydraulic Conductivity
- [i] = Hydraulic Gradient
- [n_e] = Effective Porosity
- [B] aka [p_b] = Formation Bulk Density
-
- [K_{oc}] = Soil Sorption Coefficient
- [f_{oc}] = Fraction of Organic Carbon
- R = Retardation Factor
- k = Degradation Rate
- Chemical Properties and Half-Lives Info <https://www.gsi-net.com/en/publications/gsi-chemical-database.html>
- K_{oc} Values <https://www.nj.gov/dep/srp/guidance/rs/chemproperties.pdf>
- Appendix

MW-4 Ammonia

<https://www.gsi-net.com/en/publications/gsi-chemical-database/single/28-ammonia.html>

| | |
|------------|-----------------------|
| $f_{oc} =$ | 0.001 |
| $B =$ | 1.5 g/cm ³ |
| $n_e =$ | 0.35 |
| $K =$ | 13 feet/day |
| $i =$ | 0.013 feet/foot |

$$C = C_0 e^{-\lambda t}$$

C = Final Concentration = 3000 µg/L (NJDEP Groundwater Quality Standard)
 Co = Initial Concentration = 8300 µg/L (most recent sampling event)
 t1/2 = half-life (days) = 2190 days rchatate.net/public
 t = time
 k = $\frac{0.693}{t_{1/2}}$ = 0.0003164

3215.93 days
8.81 years

$$d = V_p \cdot t \text{ (distance = transport rate} \cdot \text{time)}$$
$$= 1283.33 \text{ ft.}$$

- [K] = Hydraulic Conductivity
- [i] = Hydraulic Gradient
- [ne] = Effective Porosity
- [B] aka [pb] = Formation Bulk Density

- [Koc] = Soil Sorption Coefficient
- [foc] = Fraction of Organic Carbon
- R = Retardation Factor
- k = Degradation Rate
- Chemical Properties and Half-Lives Info <https://www.gsi-net.com/en/publications/gsi-chemical-database.html>
- Koc Values <https://www.nj.gov/dep/srp/guidance/rs/chemproperties.pdf>
- Appendix

CEA Calculations

MW-4 Benzene

| | | | | |
|----------------------------|--|--|---|-------------------------|
| Chemical K_{OC} = | 58.9 cm ³ /g http://www.seview.com/newsletter/mobility.html | $R = 1 + (K_{OC} \cdot f_{OC} \cdot B) / n_e$ 1.2524 | $V_p = (K \cdot I) / (n_e \cdot R)$ 0.3855367 feet/day | 140.72 feet/year |
| Soil Characteristic Values | $f_{OC} = 0.001$ $B = 1.5 \text{ g/cm}^3$ $n_e = 0.35$ $K = 13 \text{ feet/day}$ $i = 0.013 \text{ feet/foot}$ | | | |

Duration of CEA

$$C = C_{oe}^{kt}$$

| | |
|------------------------------|---|
| C = Final Concentration = | 1 µg/L (NJDEP Groundwater Quality Standard) |
| Co = Initial Concentration = | 1.8 µg/L (most recent sampling event) |
| t1/2 = half-life (days) = | 100 days https://www.nj.gov/dep/srp/guidance/cea/ceaquad2.pdf |
| t = time | |
| k = $\frac{0.693}{t1/2}$ = | 0.00693 |

$$t = \frac{(-\ln C/Co)}{k} =$$

84.82 days
0.23 years

CEA Distance

$$d = V_p \cdot t \text{ (distance = transport rate} \cdot \text{time)}$$

$$= \mathbf{32.70 \text{ ft.}}$$

Notes:

- [K] = Hydraulic Conductivity
- [I] = Hydraulic Gradient
- [ne] = Effective Porosity
- [B] aka [pb] = Formation Bulk Density
-
- [Koc] = Soil Sorption Coefficient
- [foc] = Fraction of Organic Carbon
- R = Retardation Factor
- k = Degradation Rate
- Chemical Properties and Half-Lives Info <https://www.gsi-net.com/en/publications/gsi-chemical-database.html>
- Koc Values <https://www.nj.gov/dep/srp/guidance/rs/chemproperties.pdf>

Kyle Young

To: srpgis_cea@dep.nj.gov
Subject: 006148, CEA
Attachments: 006148_082521.shp.xml; 006148_082521.shx; 006148_082521.dbf; 006148_082521.cpg;
006148_082521.sbn; 006148_082521.sbx; 006148_082521.shp

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Phone Number for Professional performing GIS work: 732-739-6444

Program Interest Number for Site: 006148

Name of Site as known to NJDEP: AOC-19: QC Lab/AOC-90 drum Storage Area, Hess Corporation - Former Port Reading Complex (HC-PR)

Physical address of Site: 835 West Avenue, Port Reading, NJ 07064

Submission Type Suffix: Natural Remediation

Subject Item ID: Within the site boundary

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